



FIELDMAN, NARDA'S NEW FIELDMETER

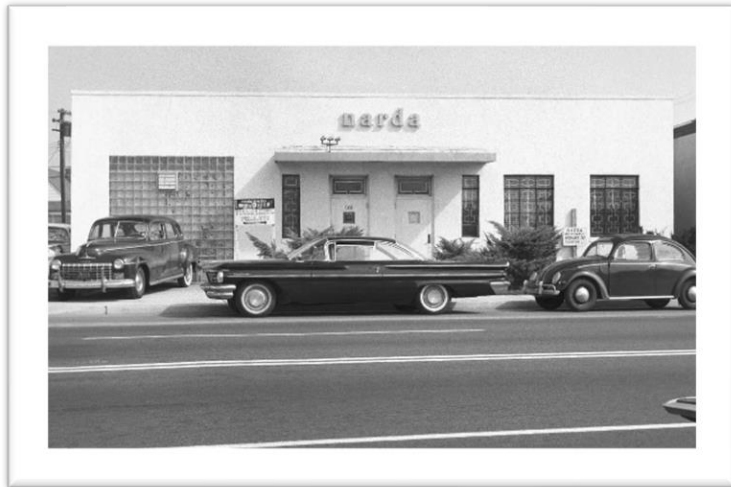
narda 
Safety Test Solutions

The Roots

- Narda USA
(Nassau Research & Development Associates)
founded Feb 1953

- Division of Wandel & Goltermann
W&G founded 1923, Division founded 1992

- PMM
founded 1968



FieldMan – only another new field strength meter?



- **Ease of use**
- **Measurement precision**
- **Documentation**
- **Innovations**
- **Cost of ownership**

Readable results

Large sunlight readable color display 5" diagonal with 1280x720 HD resolution

- Readable with and without glasses
- Readable from any angle
- Readable even in bright sunlight



Description – Graphical User Interface



- Anti-glare display for clear view from any viewing angle
- Automatic brightness adjustment via sensor
- Status bar designed similar to a smartphone including environmental sensor data and distance value
- Probe information field with relevant probe data
- Large yellow result display with isotropic and single axis values
- Field for statistical values (Min, Max, Avg, Max Avg)
- High resolution measurement graphic including marker and peak marker
- Softkeys using self-explanatory standardized symbols
- Results can be organized in the form of projects
- Text and/or voice comments can be added to any result

One hand operation

- One hand for the man, one for the ship
(old sailor's wisdom)
- Transferred into EMF-Measurement-World:
One hand for your safety, one for the instrument

You will easily understand after a measurement on a stormy, slippery, 160-meter-high platform of a broadcasting transmitter



FieldMan is an all-in-one electromagnetic fieldmeter for measurements up to 90 GHz

- **Isotropic probes available from 0 Hz (DC) to 90 GHz**
- Digital probe interface – no more meter calibration
- Powerful frequency and time domain analysis including Weighted Peak
- WiFi/Bluetooth interface for remote operation via smartphone app (Option)
- Built-in GPS receiver and rangefinder for easy location determination (Option)
- MicroSD removable media for easy personalization
- Climatic sensors for temperature, humidity and air pressure
- Fast data transmission via a wide variety of interfaces
 - › optical interface (≥ 1 Mbit/s), recommended for remote operation
 - › USB-C (480 Mbit/s) also used for charging
 - › Gigabit Ethernet (1000 Mbit/s)
 - › or wireless



Required measurement equipment for application in ELF and RF

- Past: Solution 1



- Past: Solution 2



- Now: FieldMan



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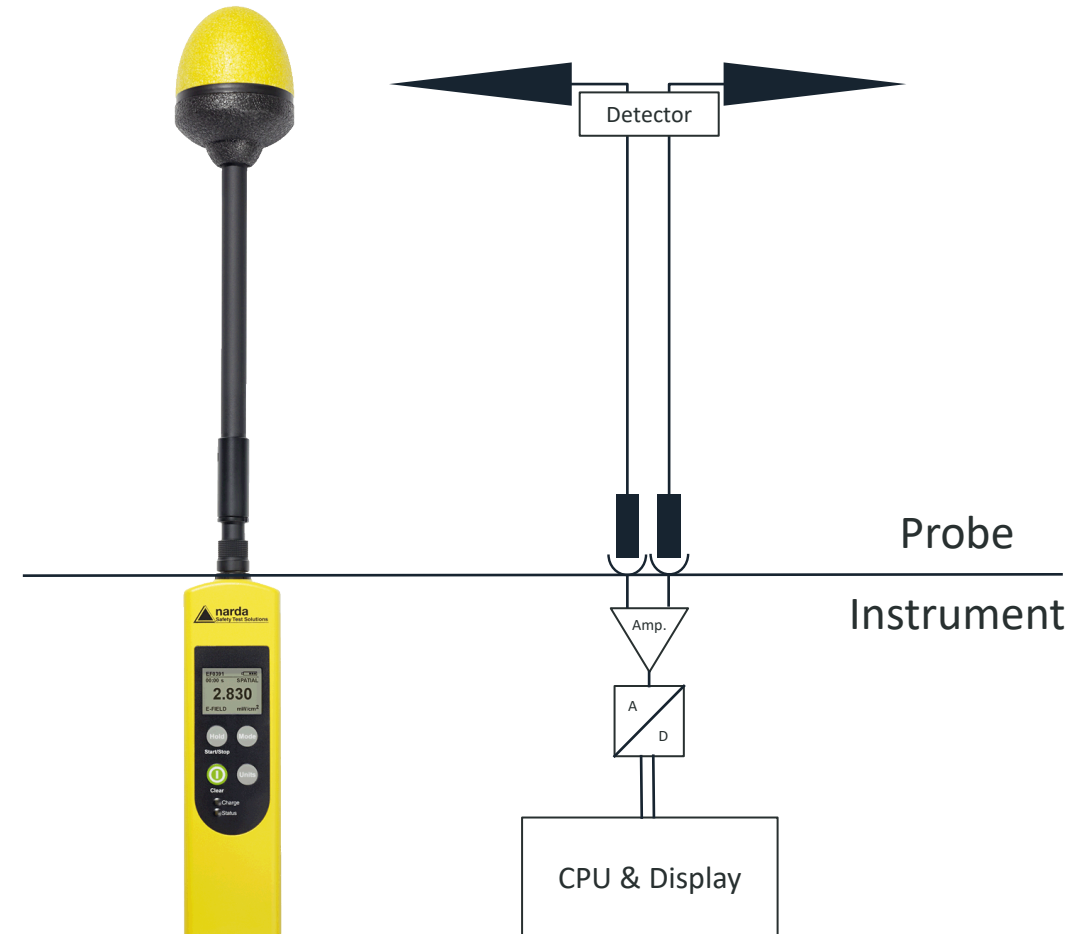
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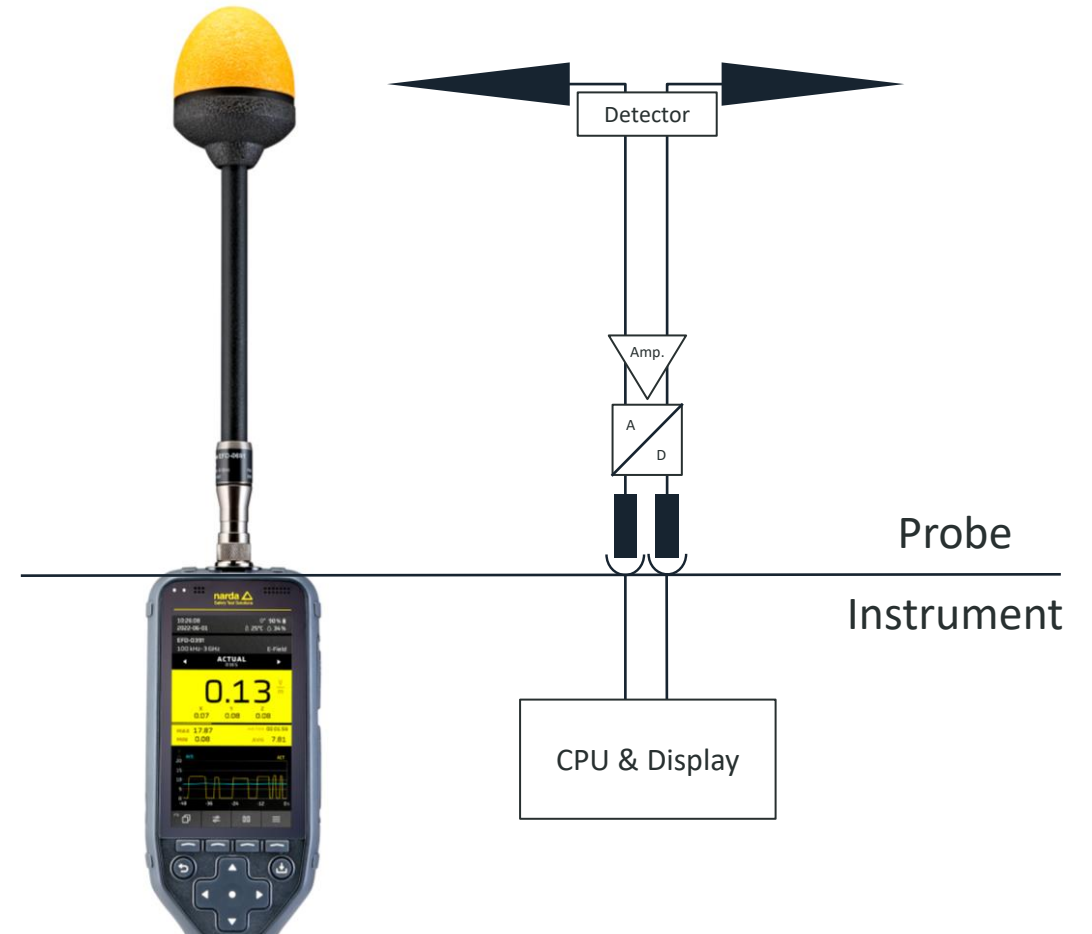
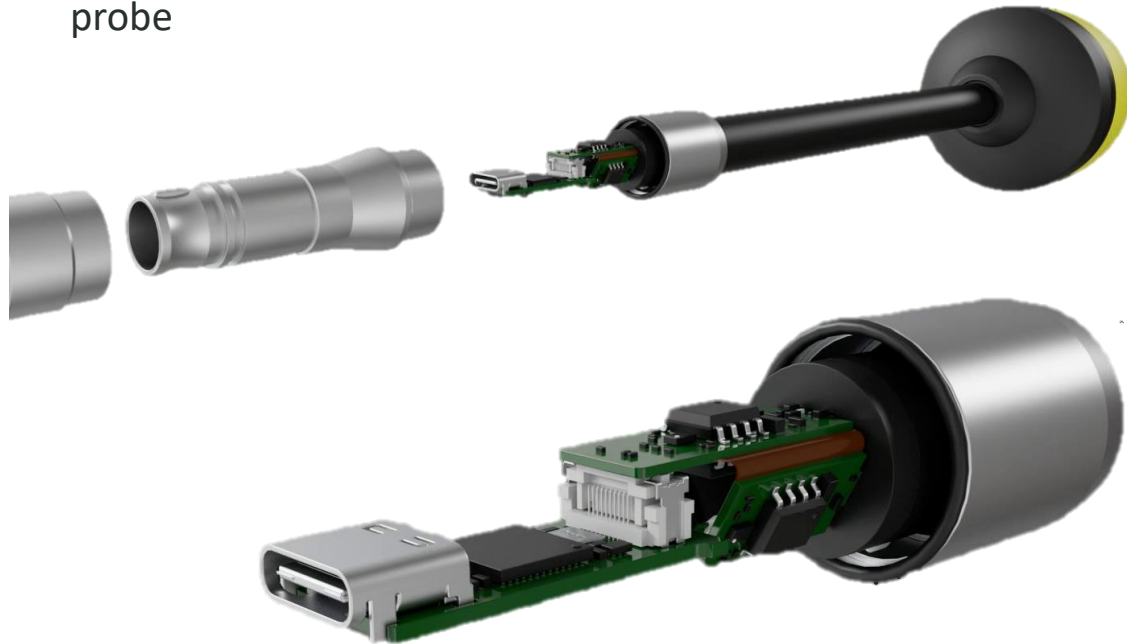
Digital Interface – What is it?

- Output signal of **any** broadband probe is very weak
 - Very high impedance, very very small voltage and current
- The transmission of such a small signal via a connector is not unproblematic
 - The connector is exposed to environmental stresses:
 - Dust
 - Dirt
 - Humidity etc.
 - Which can have an impact to the transmission of the signal and finally to the measurement result

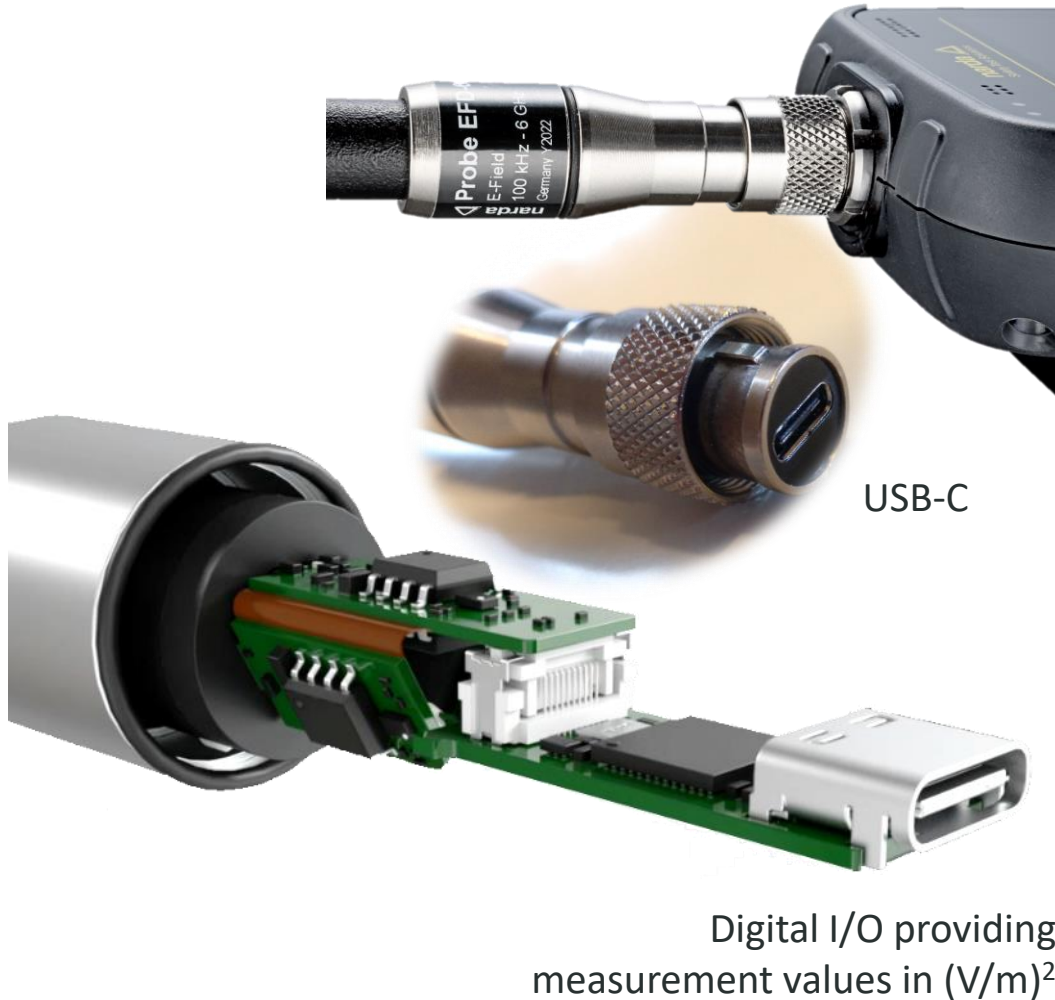


Digital Interface – What is it?

- On FieldMan, amplifier and digital signal processing is inside the probe
- Output signal of the probe is no longer an analog but digital signal
 - No more impact to measurement result caused by connector
 - All parts with an impact to calibration are located inside the probe



The new digital Probe Interface

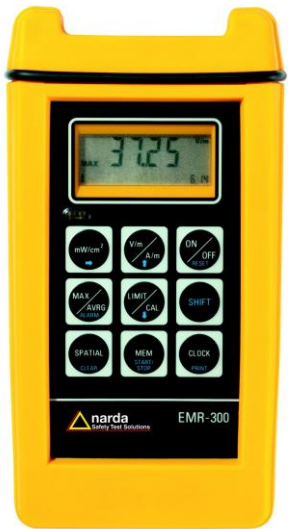


- Less influence when using a probe extension cable
- Supports the direct connection to a measuring computer (RF via optical repeater recommended)
- Durable, extremely robust USB Type C connector
- Calibration of the meter is not required (meter without influence)
- Accredited calibration is included (for RF, for LF in progress)
- Integrated probe and sensor test for higher reliability (sensor test short/open depending on the probe type)
- Automatic temperature-controlled offset correction eliminates zeroing during measurements
- The measured probe temperature is displayed on the FieldMan
- Lower measurement error by compensating for the typical temperature coefficient (for 3 and 6 GHz probes)

Less influence when using a probe extension cable

Weaknesses:

- Additional “analog” connector
- Movements of the cable created ghost field strength
- Impact of metallic cable to the field
- Pic-up of signals by cable



Less influence when using a probe extension cable

Weaknesses:

- ~~Additional “analog” connector~~
- ~~Movements of the cable created ghost field strength~~
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- ~~Pic-up of signals by cable~~



*Cable exemplary



Less influence when using a probe extension cable

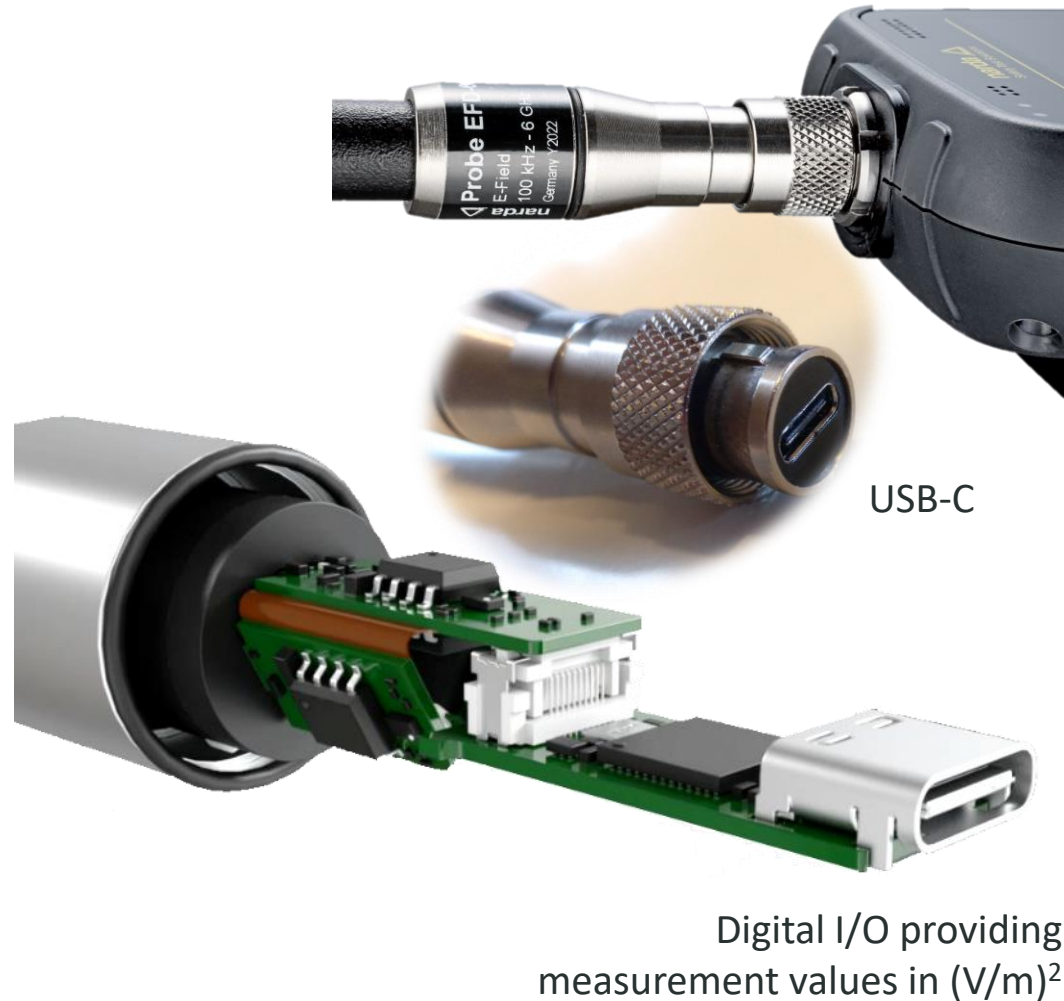
Weaknesses:

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- ~~Movements of the cable created ghost field strength~~
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- **Perfect solution: use of probe repeater and fiber optic cable**



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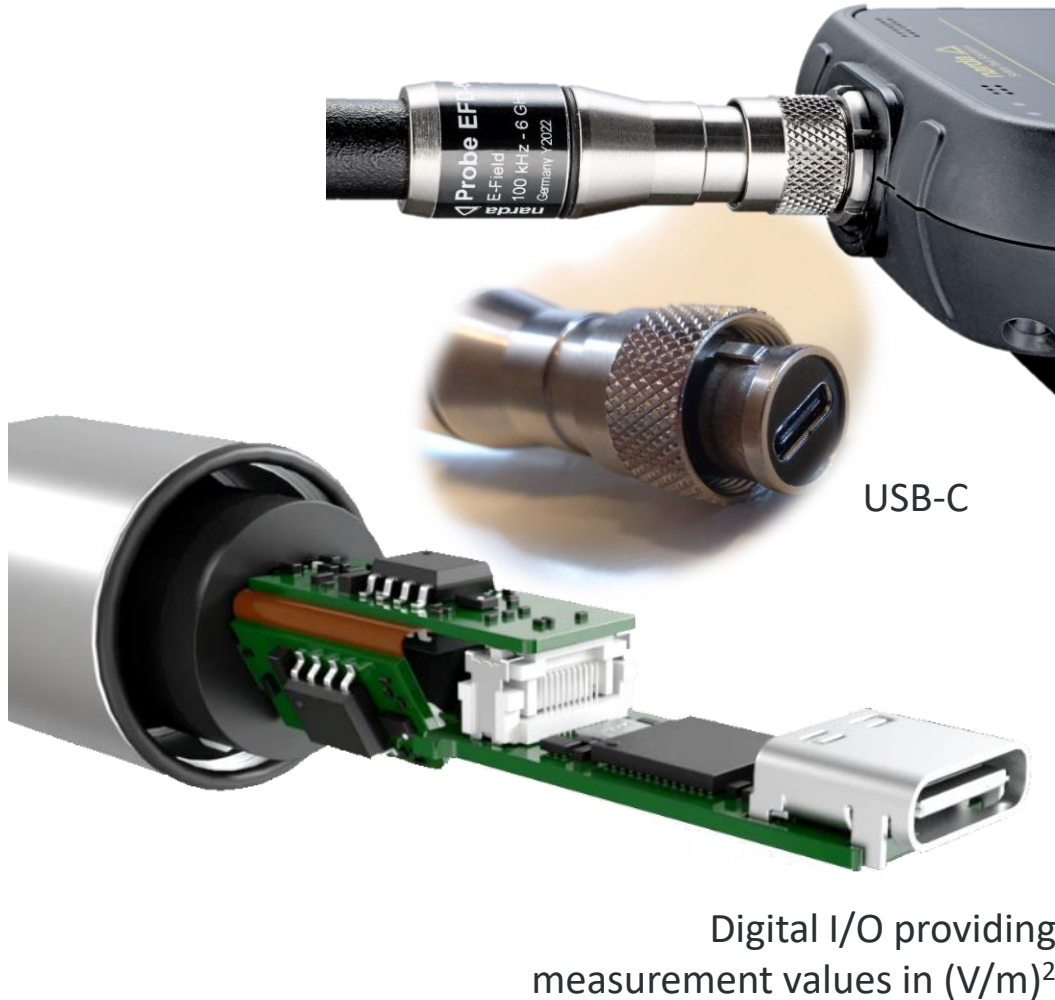
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Calibration of the meter is not required

- Single basic unit, single probe:

With digital probe interface

- Saves money

- Single basic unit, multiple probes:

With digital probe interface:

- Saves money
- During calibration of a probe, remaining probes can still be used

Without digital probe interface:

- during recalibration of basic unit, no work possible

- Multiple basic units, multiple probes:

With digital probe interface

- Saves money

Calibration of the meter is not required, accredited calibration is included

- Single basic unit, single probe:

With digital probe interface

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- Single basic unit, multiple probes:

With digital probe interface

- Saves money
- During calibration of a probe, remaining probes can still be used

Without digital probe interface:

- During EACH recalibration, no work possible!
- Every probe must be returned with the basic unit

- Multiple basic units, multiple probes:

With digital probe interface

- Saves money
- Nearly full workforce is available as every probe works with every basic unit under accredited conditions

Without digital probe interface:

- as accredited calibration is only valid between a specific pair of basic unit and probe, there was no interchange inside the pool of equipment possible.

The new digital Probe Interface



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English


an IBS Communications Company

Notes on using the handheld transmitter

The Somfy 1841113 handheld transmitter (Narda part number 2244/90.38) can be used to test the function of E-field and H-field probes very simply as long as the probe is suitable for measuring fields at around 27 MHz. More information about this function test is found in the Narda NBM-5xx operating manual.

Handheld transmitter

The handheld transmitter is ready for immediate use. Press and hold the button to switch the transmitter on automatically and generate a test signal at approximately 27 MHz. A yellow LED indicates when the transmitter is activated. Release the button to switch the transmitter. For the probe function test, hold the transmitter close to the probe (see right). The indicated field strength is more than 50 V/m.

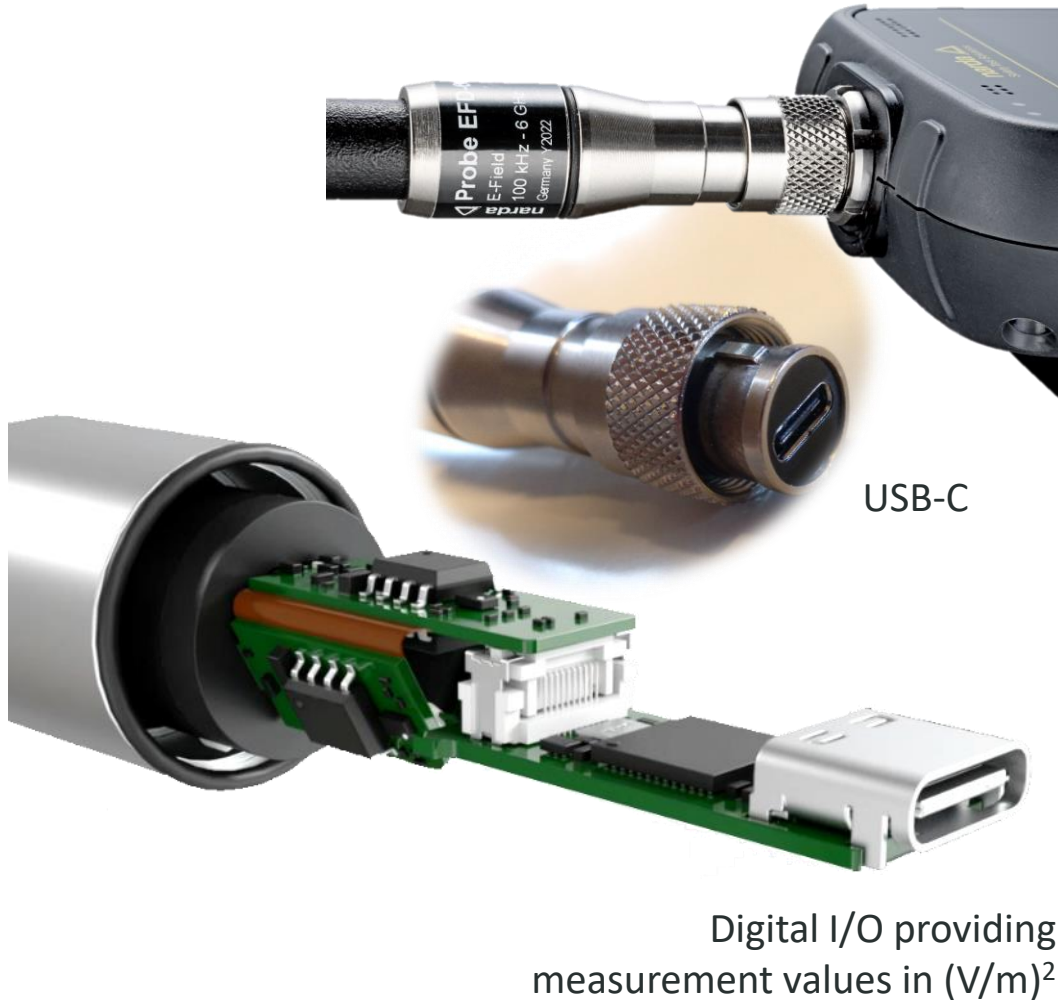


Battery replacement

The handheld transmitter uses a 9 V battery (Alkaline, type 6LF22) which will need replacing after 2 years of use. The battery may also need replacement if the generated field strength is greatly diminished and the probe under test does not indicate any significant increase in field strength. To replace the battery, pull off the cover (labeled "Somfy"). The battery is underneath this cover. Be careful not to damage the cable for the battery.

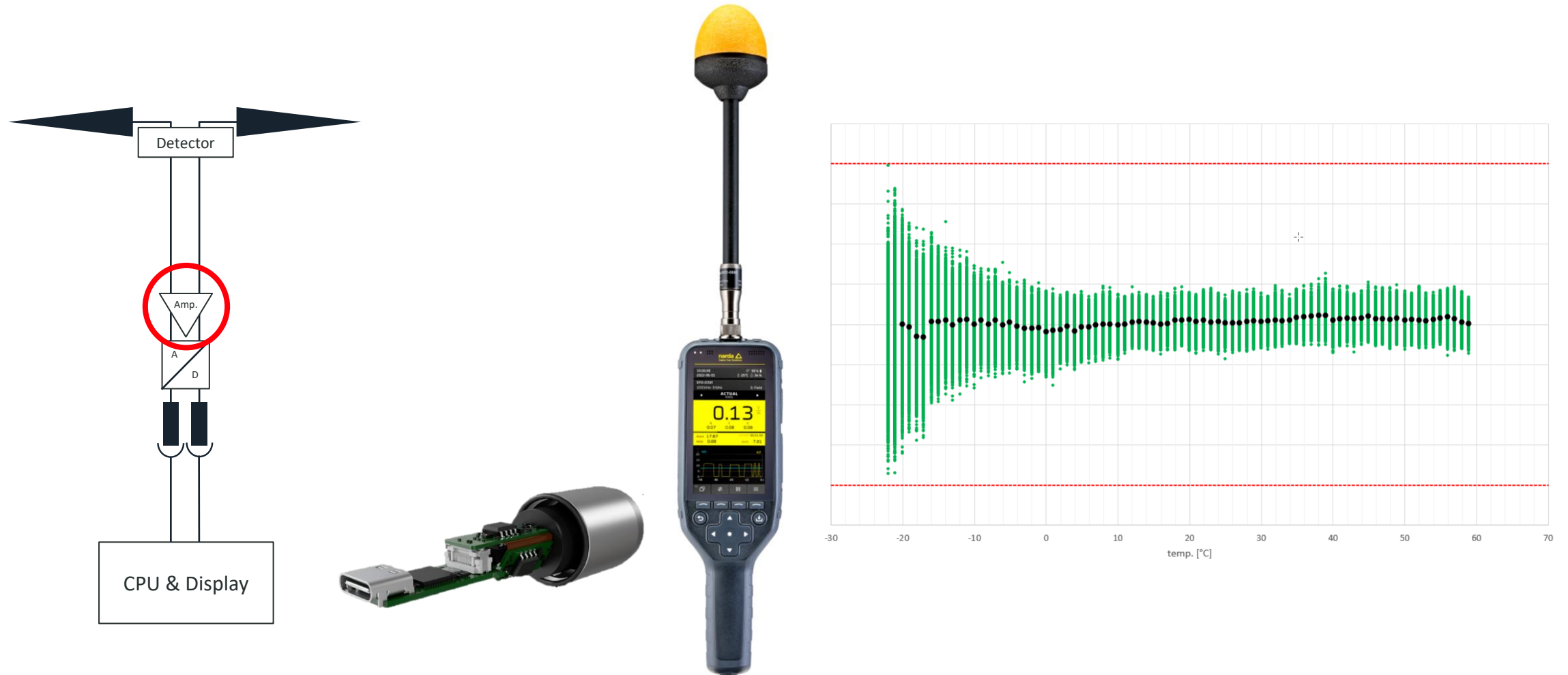


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Automatic temperature compensation makes “Zeroing” redundant



- **Ease of use**
- **Measurement precision**
- **Documentation**
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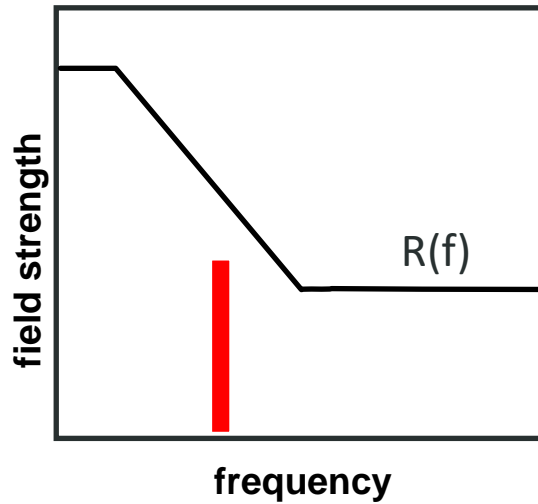
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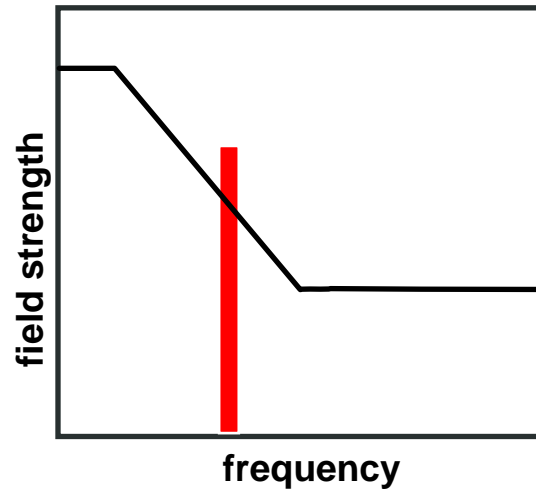


ELF: Weighted Peak Measurement

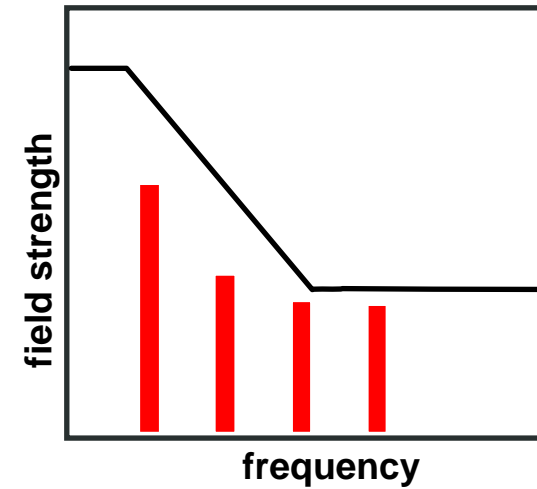
- Weighted Peak Method (WPM)



compliant



exceeded



?



%
of
Standard

ELF: STD = WPM & WRM ????

- WPM means: **W**eighted **P**eak **M**easurement or measurement against a standard using peak detector
- WRM means: **W**eighted **R**MS **M**easurement or measurement against a standard using RMS detector
- STD means: Instrument can perform both measurements
- STD is available in EFA 200/300, ELT-400 and EHP-50F and now FieldMan

ELF: STD = WPM & WRM !

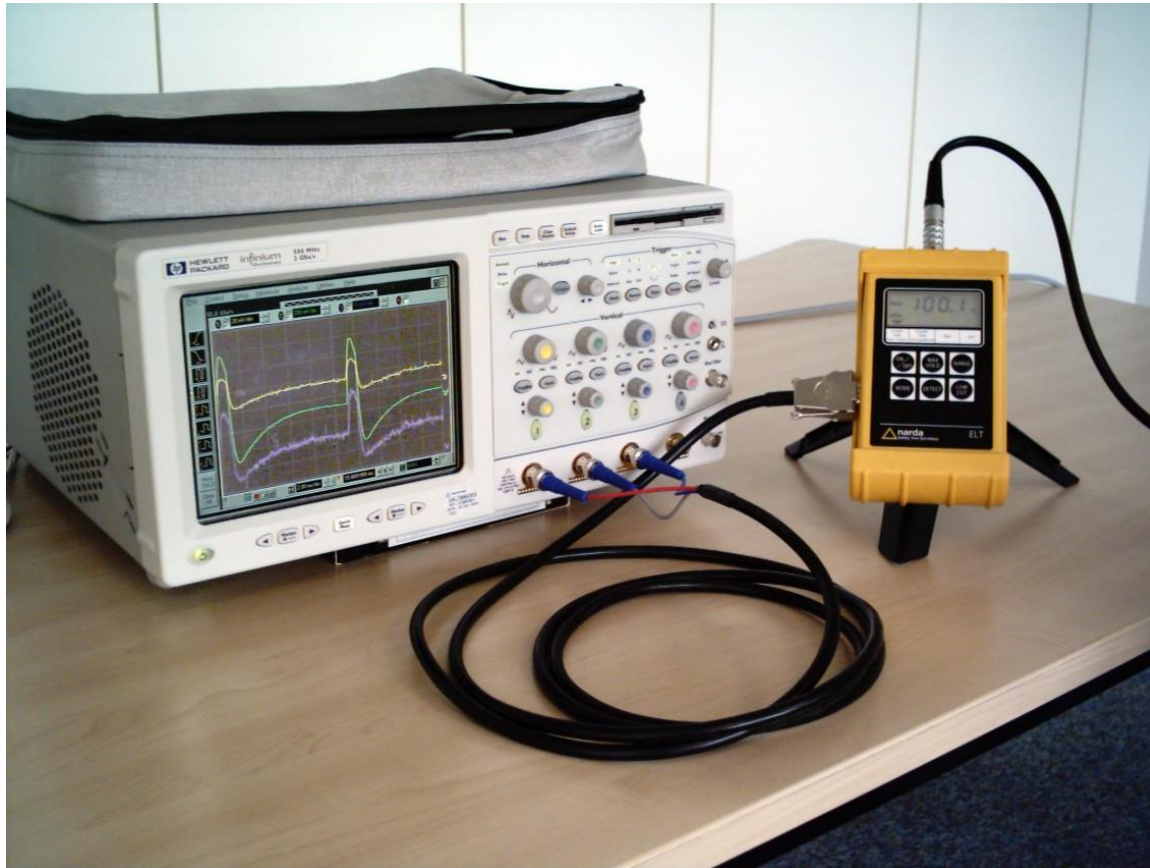
Know problems:

- EFA 200/300 no longer available ☹️
- ELT-400 standard compliant incl. 100 cm² antenna, but standard is hardware
-> change of standard means new instrument ☹️
- EHP-50F standard is software, but antenna is not 100 cm² ☹️
- FieldMan with BFD-400-1 available soon 😊, standard is software 😊, antenna is 100 cm² 😊

ELF: Scope Mode

- ELT-400

Visualization of the time function on an oscilloscope



- FieldMan

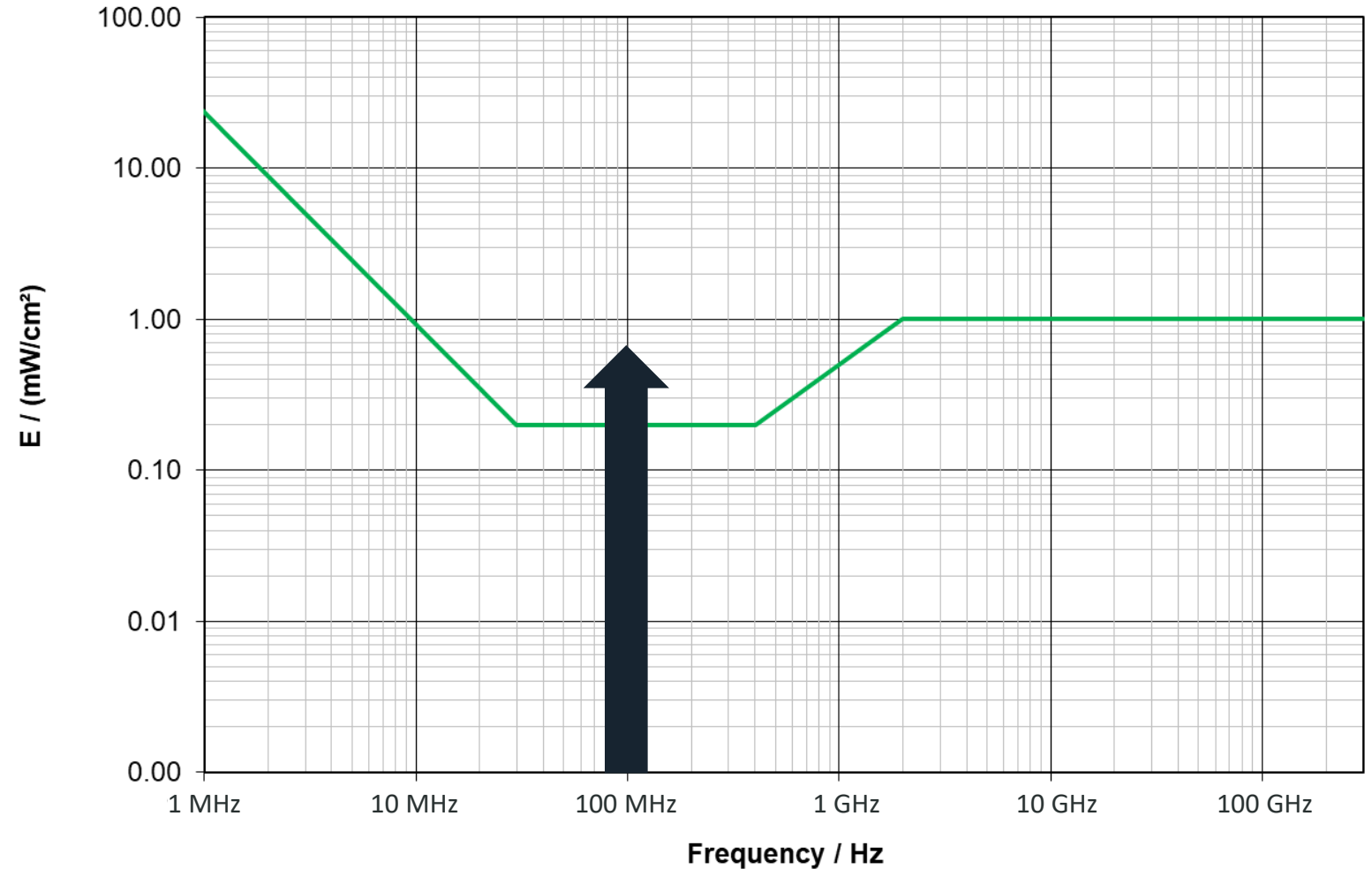
Visualization of the time function on basic unit directly



RF: “Shaped” Probe According to ICNIRP

Reading at different frequencies, measured with a flat and a shaped probe:

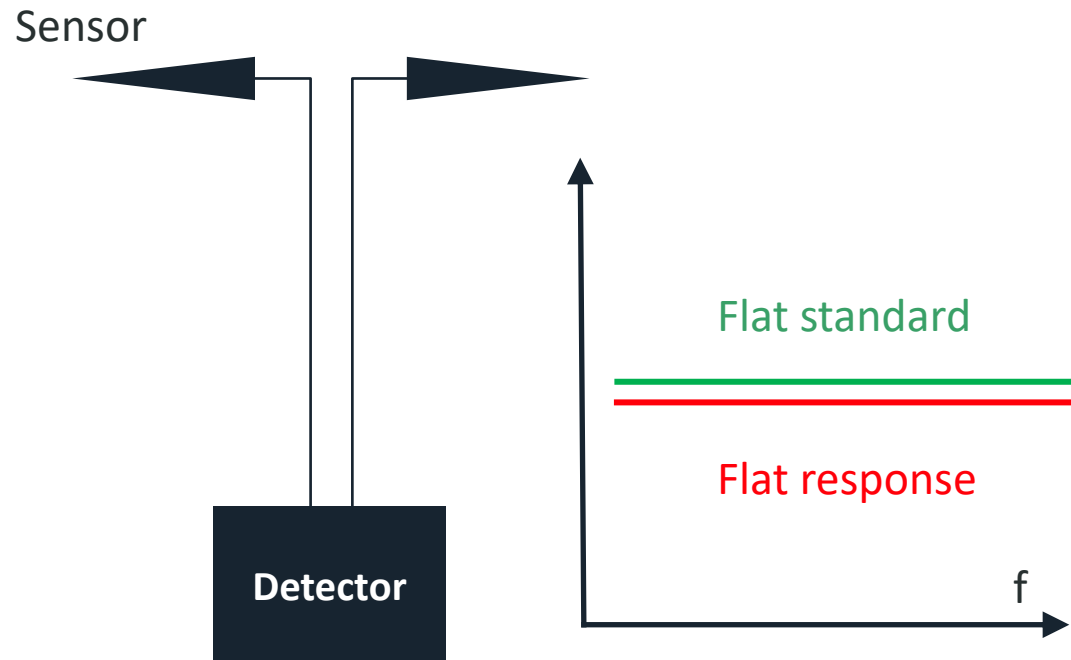
Frequency	Flat probe reading	Shaped probe reading



RF: "Shaped" probe realization

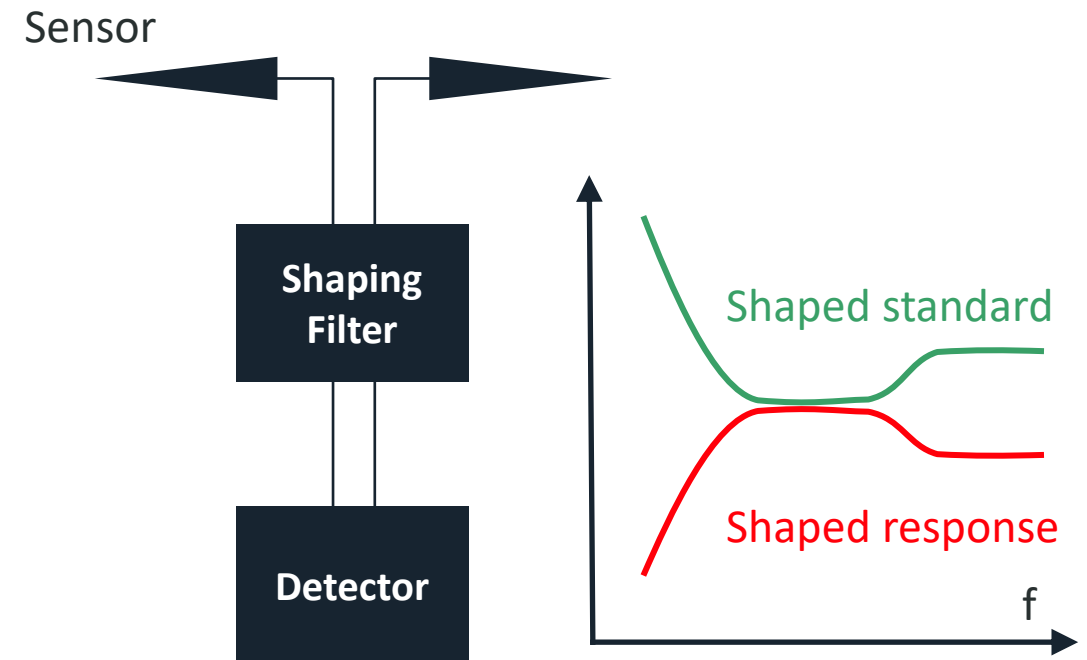
FLAT PROBE

- Output signal of the sensor is directly passed on to the detector.



SHAPED PROBE

- The output signal of the probe is first fed to a filter circuit and then passed on to the detection system.



- Measurement precision
- **Ease of use**
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WiFi/Bluetooth interface for remote operation via smartphone app

E.g.:

- Remote operation
- Photos*, videos*, maps, etc. can be transferred into the result memory of FieldMan and combined with measurement results
- Back-up of measurement data

*Remark: a camera was not integrated into the FieldMan, because many security areas do not allow access with a camera



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FieldMan's smart device stand



Low stand



High stand

Ultrasonic range finder (option)

- Flap opened (= high stand):
Ultrasonic range finder for distance measurements (measurement height) from 25 cm up to 4 m
 - Units m, in, ft or yd
 - Resolution 1 cm, detection angle 15 degrees
 - A meter stick becomes superfluous
- The smart stand protects probes from mechanical stress when placed on the table
- High stand for 100 cm² and shaped probes



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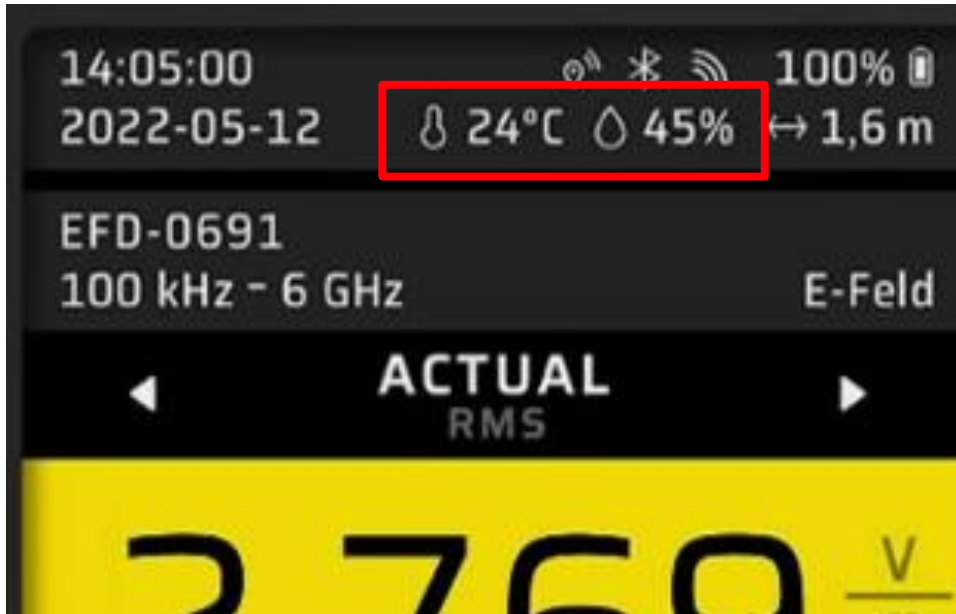


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- Environmental data are requested by many national and international measurement procedures
- Many times, they are measured by an additional, external device
- With FieldMan, (probe) temperature, humidity and air pressure are automatically recorded with every measurement data
- Temperature and humidity are visible inside the display

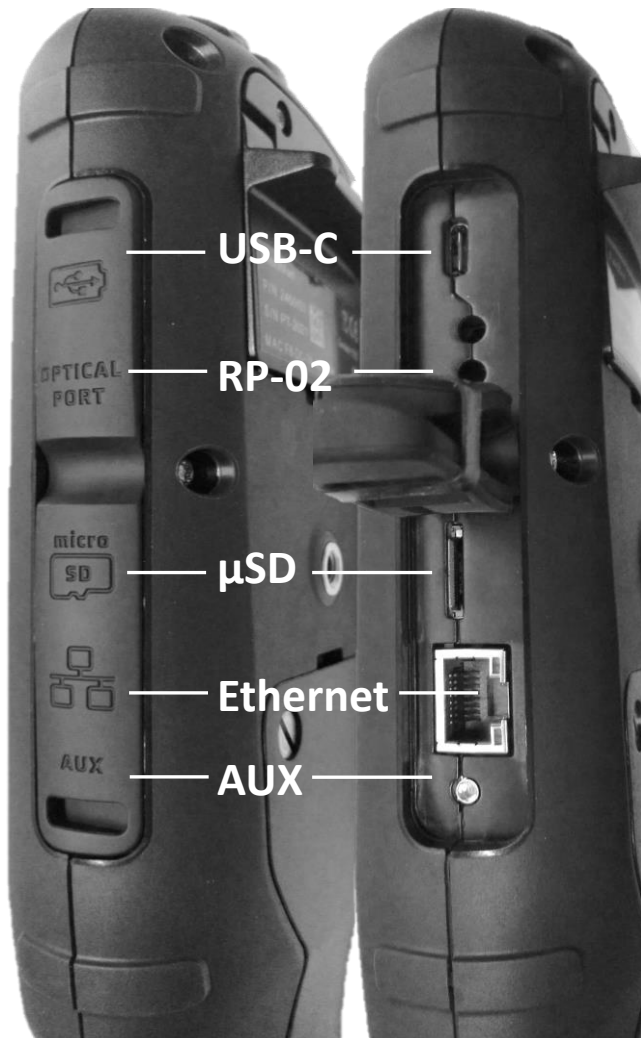
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Description – Connector Panel



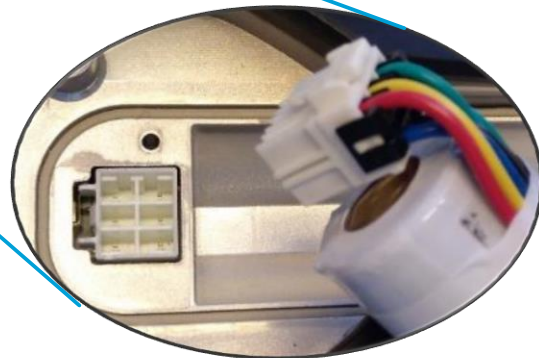
IP54 protection
with the rubber flaps closed



- USB-C PD (power delivery) for
 - Fast charging, but any USB connection works (just slower)
 - Data transfer to Narda-TSX (PC software)
- RP-02 optical port for
 - Controlling the EHP-50F/G and HP-01 probes
 - Remote controlled measurements, electrically decoupled
 - Data transfer to Narda-TSX (PC software)
- Gigabit Ethernet for
 - Easy network integration, fast data communication, IPv4 and IPv6
 - Data transfer to Narda-TSX (PC software)
- AUX connector (MMCX coax)
 - reserved for future use

- Measurement precision
- **Ease of use**
- **Documentation**
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- Cost of ownership

Description – Power Supply



- User-replaceable lithium-ion battery pack (included and available as spare part)
 - 16 hours operation (with broadband probes and analyzers)
 - 8 hours operation expected (with selective probes)

- Fast charging mode:
80% in 2.5h, 100% in 4h, 12 V 2.5A using the supplied charger (2259/92.29) or equivalent charger

- Fast car charger available as accessory (2259/92.28)

- USB-C/USB-C cable for fast charging and fast data transfer included

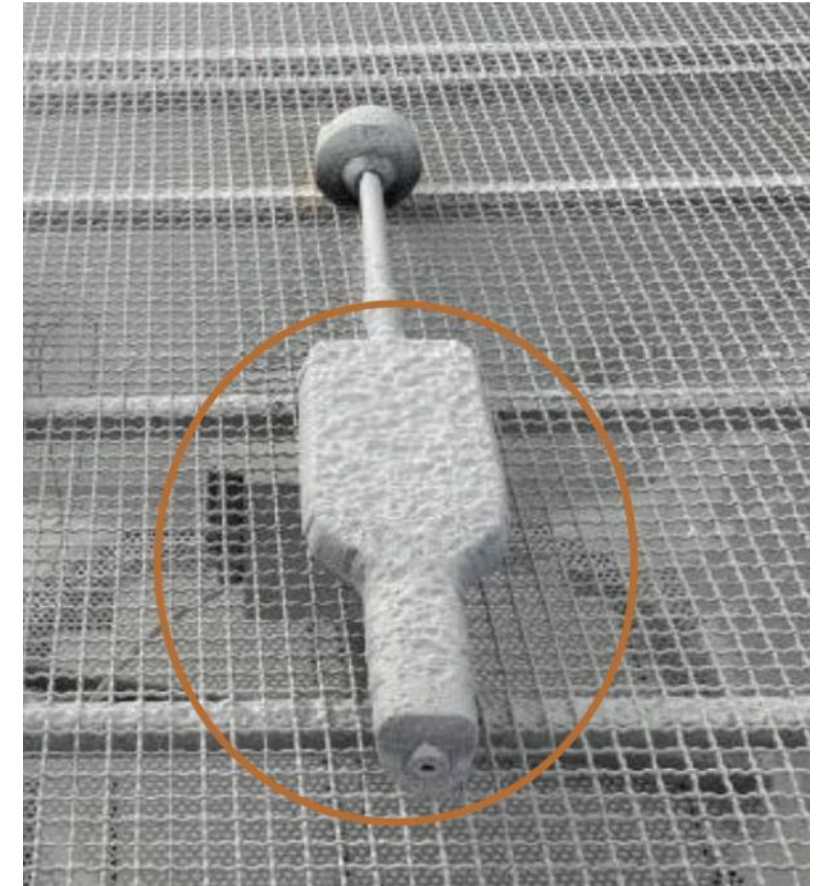
- FieldMan displays “Fast charging” or “Charging” and status in %
- Long time via power bank (not offered by Narda)



Description – FieldMan made for tough outdoor use












Type approval test for IP 54 (splash-proof)



USP: Main Unit and Probe operating from
-20 °C to +50 °C










FieldMan digital probes

FieldMan Compatible Probes – Overview

DC to 1 kHz	400 kHz	400 kHz	30 MHz	1 GHz	6 GHz	40 GHz	90 GHz	50 GHz
H	E+H	H	H	H	E	E	E	E Shaped
HP-01	EHP-50F	BFD-400-1 * (100 cm ²) BFD-400-3 * (3 cm ²)	HFD-3061	HFD-0191	EFD-0391 EFD-0392 EFD-0691 EFD-0692	EFD-1891 * EFD-4091 *	EFD-5091 EFD-6091 EFD-9091	EAD-5091 EBD-5091 ECD-5091 EDD-5091 * (ICNIRP 2020)
								
Optical connection		Digital probe interface						

* New sensor technology

FieldMan Compatible Probes – Overview and Applications

Frequency range (up to)	DC to 1 kHz	400 kHz	400 kHz	30 MHz	1 GHz	6 GHz	40 GHz	90 GHz	50 GHz
Field type, magnetic (H) or electric (E)	H	E+H	H	H	H	E	E	E	E Shaped
Probe models	HP-01	EHP-50F	BFD-400-1 (100 cm ²) BFD-400-3 (3 cm ²)	HFD-3061	HFD-0191	EFD-0391 EFD-0392 EFD-0691 EFD-0692	EFD-1891 EFD-4091	EFD-5091 EFD-6091 EFD-9091	EAD-5091 EBD-5091 ECD-5091 EDD-5091
									
5G mobile radio / telecommunications				●	●	●	●	●	●
Broadcast radio / TV				●	●	●	●		●
Satellite communications							●	●	●
Radar							●	●	●
Industry: Heating and tempering				●		●			
Industry: Plastics welding				●		●			
Industry: Semiconductor production				●		●			
Medicine: Diathermy, hyperthermy						●			●
Leak location							●	●	●
Household appliances			●						
Electric welding equipment		●	●						
Railroad operations	●	●	●						
Automotive operations	●		●						
Energy supply systems		●	●						
Electric medical devices	●	●	●						
Accredited calibration included				●		●	●	●	●
Probe interface	Optical connection			Digital probe interface					



- Isotropic Measurement for magnetic Fields from 1 Hz to 400 kHz
- 100 cm² sensor area requested by several standards
- Simple positioning due to geometrically arranged coils (no analytical angle)
- Accredited calibration will be included in the future (in progress)
- Integrated probe and sensor test for higher reliability
- Frequency domain with powerful real-time analysis
- Time domain WPM and WRM is included in the probe for all relevant standards like: ICNIRP 1998, ICNIRP 2010, 2013/35/EU, GB-8702-2014 (China), EMFV 2016 (Germany)
- Triggered Scope function for short signals
- Fast data streaming to a personal computer
- Supports the direct connection to a measuring computer or test system via USB 2.0 connection
- A similar probe with 3 cm² sensor area will follow

Probe Accessories

Probe Accessories – Extended Broadband Probe Compatibility

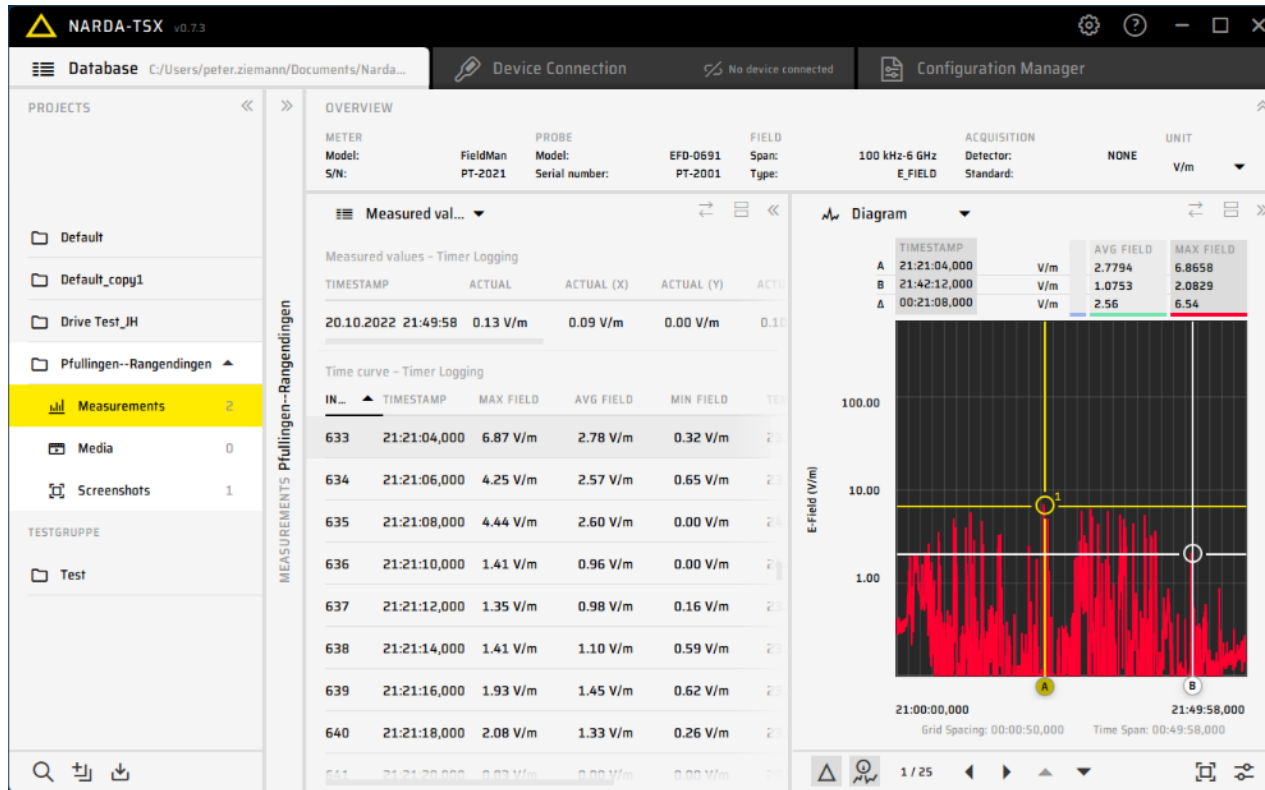


FieldMan Set and Options

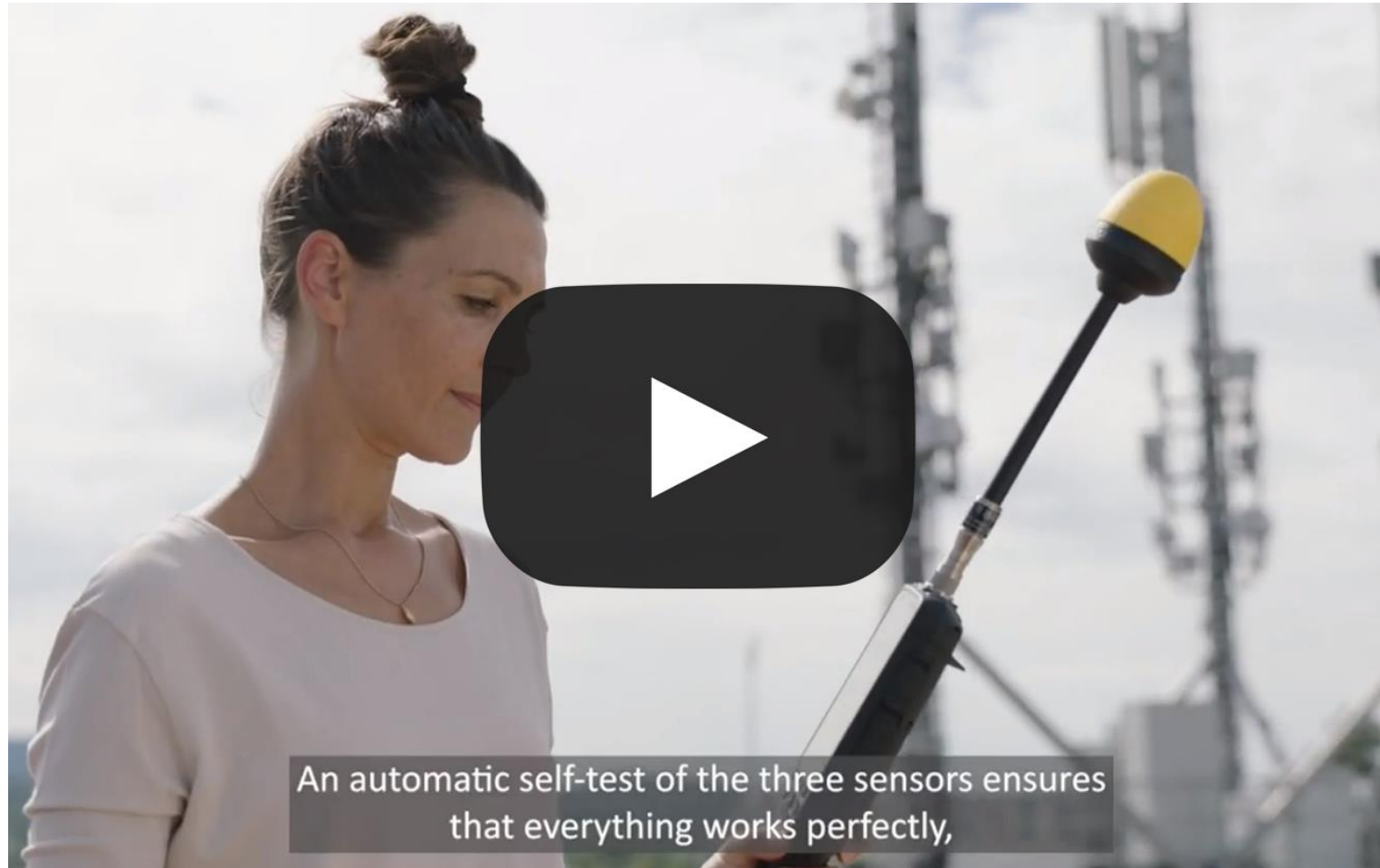


FieldMan Basic Set 2460/101 (no probes included)

- Hard case, power supply, shoulder strap, USB-C cable, marking rings for probes, Safety Instructions, Quick Start Guide, USB-stick: manuals
- Printed Quick Start Guide in DE, EN, FR, ES, IT, ZH (Chinese)
- Operating Manual on USB-stick in DE, EN, FR, ZH
- Space for HP-01 and RadMan (2) available
- Plus 5 additional probes
- Matches both FieldMan and NBM probes
- PC software Narda-TSX included (free download)



- Narda-TSX is the new software platform for FieldMan and other subsequent Narda products under one common shell
- Modern and easy to understand user interface for
 - Managing measurement data (download, export)
 - Result evaluation and preparation of measurement reports
 - Managing device configurations (setups, standards, etc.)
 - Creation of user defined standards (exposure limits)
 - Adding Maps for the measurement location (Narda map server)
 - Performing Live Measurements (Option)
- Measurement data management in user-defined projects and groups
- Narda-TSX can be downloaded free of charge from the internet



An automatic self-test of the three sensors ensures that everything works perfectly,



ANY

QUESTION?



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